

CAG Meeting

Velsicol Update

September 19, 2018

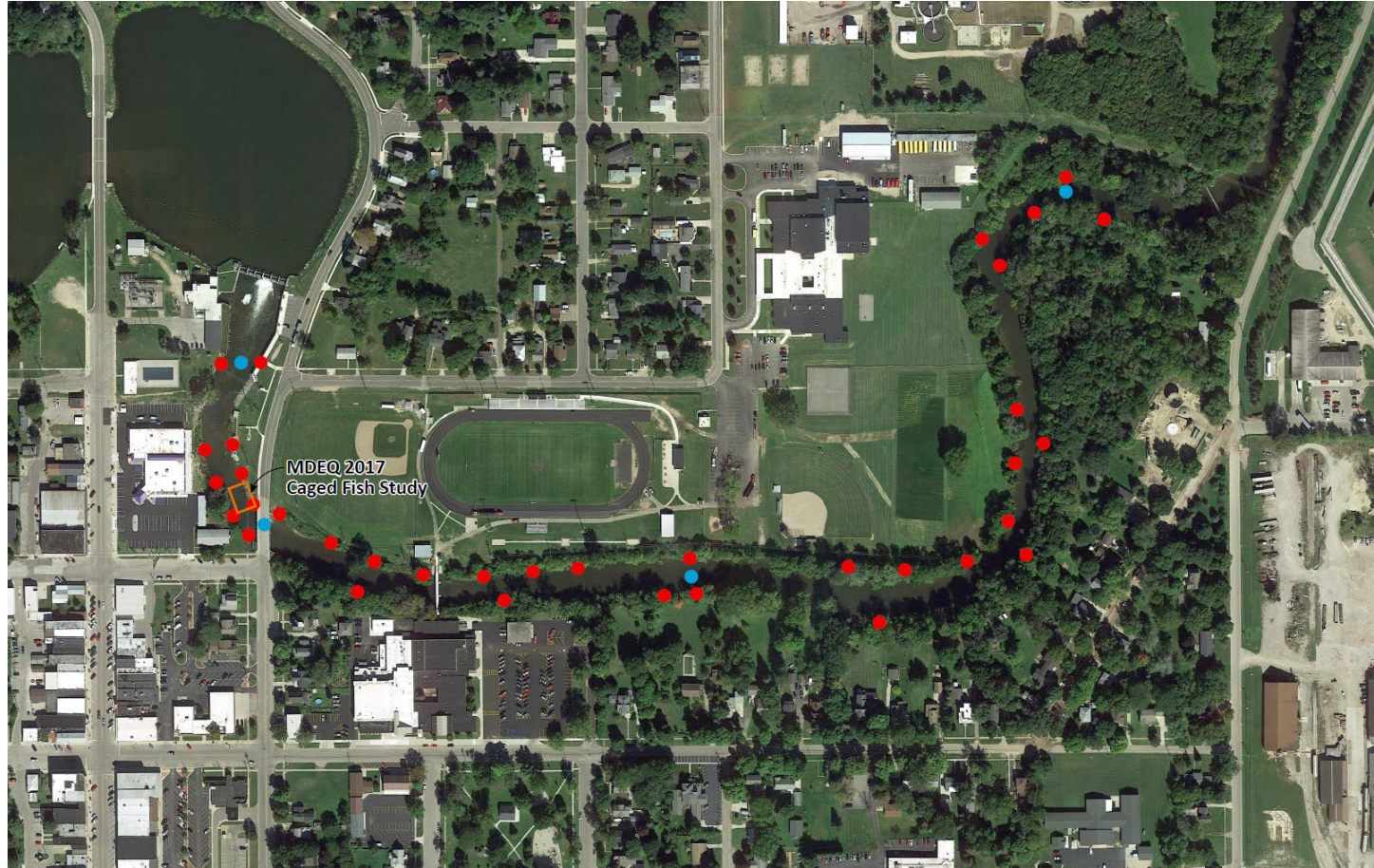
Velsicol Burn Pit

- Continue to move forward on hook-up of 11 homes to municipal water provided by St. Louis (GAWA)
 - Access agreements mailed and about half returned to date
 - Design work has started with completion scheduled for spring 2019
 - Requesting funds in spring 2019
- Site preparation design for in-situ thermal treatment and removal of ash piles underway
 - Requesting funds in spring 2019
 - Discussions with golf course owners and property owner for placement of new entrance road on his property
- In-situ thermal treatment unlikely until 2021 at earliest (after in-situ thermal of Area 2)

Downstream Pine River Study (Operable Unit 3)

- Expecting second year ecological study by Michigan State prior to Thanksgiving
- Evaluating a possible interim remedy decision (ROD) for floodplains near St. Louis dam
 - Pilot study for use of amendments to sequester DDT in floodplains farther downstream
 - Developing sampling plan for bank samples near athletic fields
 - Based on MDEQ's cage fish study and data gap for river banks along athletic fields.
- Unknown if funding will be available to finish Remedial Investigation/Feasibility Study or do pilot study

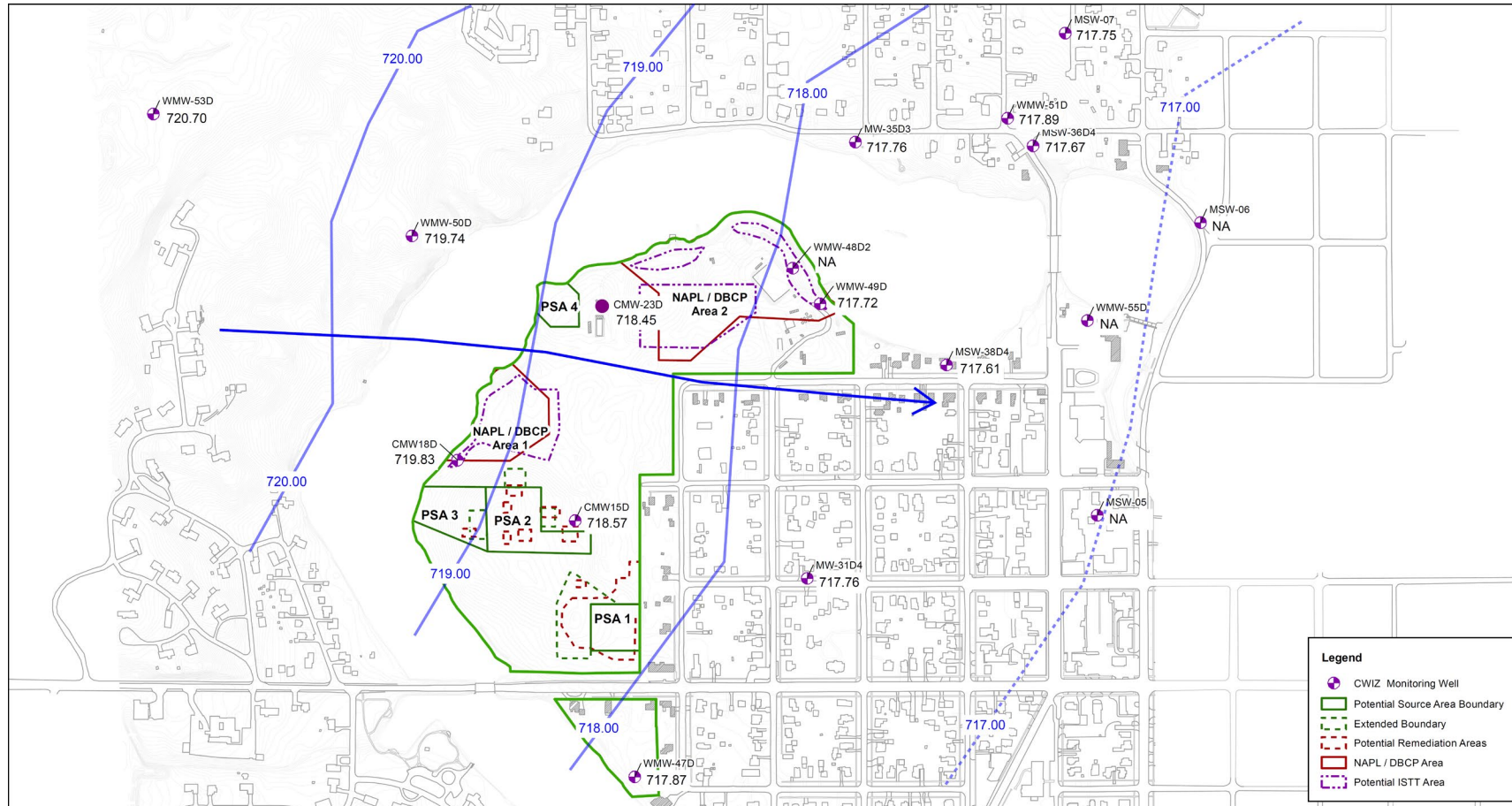
Proposed Riverbank Sampling Locations



Velsicol Plant Site

- Funding provided for slurry wall investigation in 2019
- Funding provided to continue to operate groundwater/NAPL collection trench
 - 20,000 gallons per week pumped and transported off-site for disposal
- Developing groundwater study
 - Determining groundwater/NAPL collection trench in vicinity of Area 1
- Completed new round of groundwater level measurements
- Block 1 in ANP drainage improvements completed

Groundwater Levels – August 2018



Block 1 picture



In-situ Thermal Treatment Area 2

- Possible heating early next summer
- Implementing lessons learned from Area 1
- Funding has been provided for Area 2

In-situ Thermal Treatment of Area 1

- Purpose is to reduce future groundwater treatment/costs through treatment of principal threat waste
- Heating and Treatment Progress
 - Started on March 6, 2018
 - 100 °C (212 °F) reached on July 19, 2018
 - Heating continues to at least October 18, 2018
 - Average temperature over one-acre is 103.4 degrees C
- Used 8,112,000 kWh of electricity (105% of expected use)
- ~20,000,000 gallons discharged (~5,000,000 from wellfield & ~15,000,000 from scrubber blowdown [city water])
- Approximately 52,000 pounds of contaminants recovered

In-situ thermal Treatment of Area 1

- Adding citric acid and peracetic acid as water treatment agents
- Starting to evaluate diminishing returns
- Developing soil sampling plan for Area 1

Weir Tank – May 31, 2018



Weir Tank Water/DNAPL



- Top of Tank (mostly water)
 - 0.4 ppm Benzene; 0.145 toluene
- Bottom of Tank (DNAPL)
 - 4.78 ppm Benzene; 0.74 ppm 1,2 DCA; 1 ppm Chlorobenzene; 0.8 ppm Toluene; 1.64 ppm DBCP
- Liquid pumped from tank and transported off-site for incineration

Weir Tank – September 10, 2018



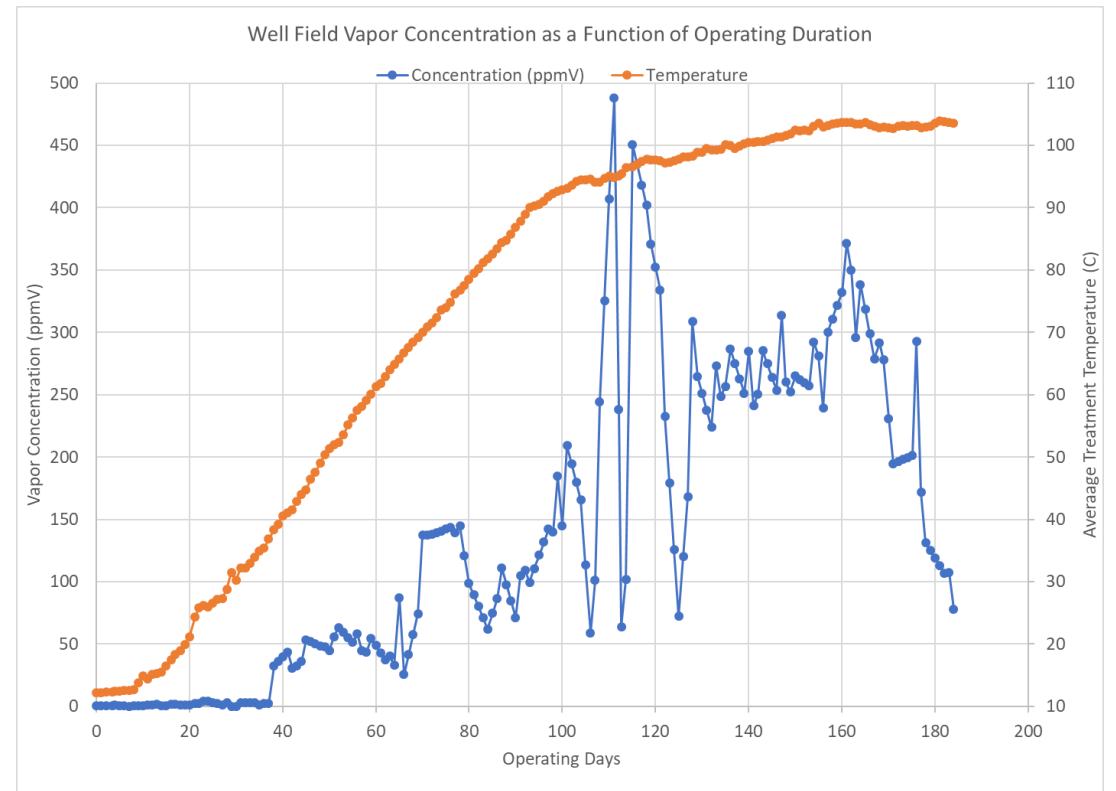
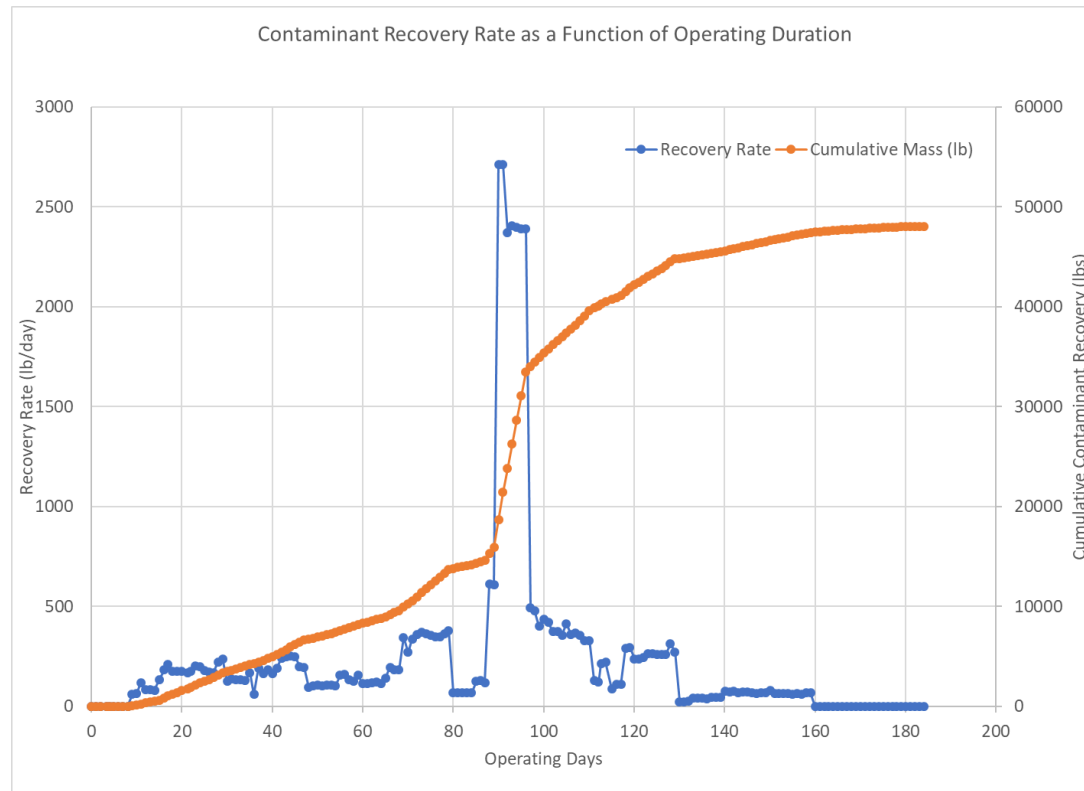
- Since early June, less NAPL recovery
- 2 inches LNAPL and 4 inches DNAPL in September
- Checking weir tank weekly
- No significant change of NAPL levels on September 18

Diminishing Returns – Evaluation Criteria

- Three evaluation criteria for the ISTT performance standard in the Record of Decision:
 - *Treatment of the source area using ISTT has reached an asymptotic rate of COC recovery*
 - *Additional input of subsurface energy will not increase COC mass removal rate*
 - *Extended operation of the ISTT system offers no further reduction in DNAPL mobility and migration from shallow outwash*

Diminishing Returns – Criterion 1

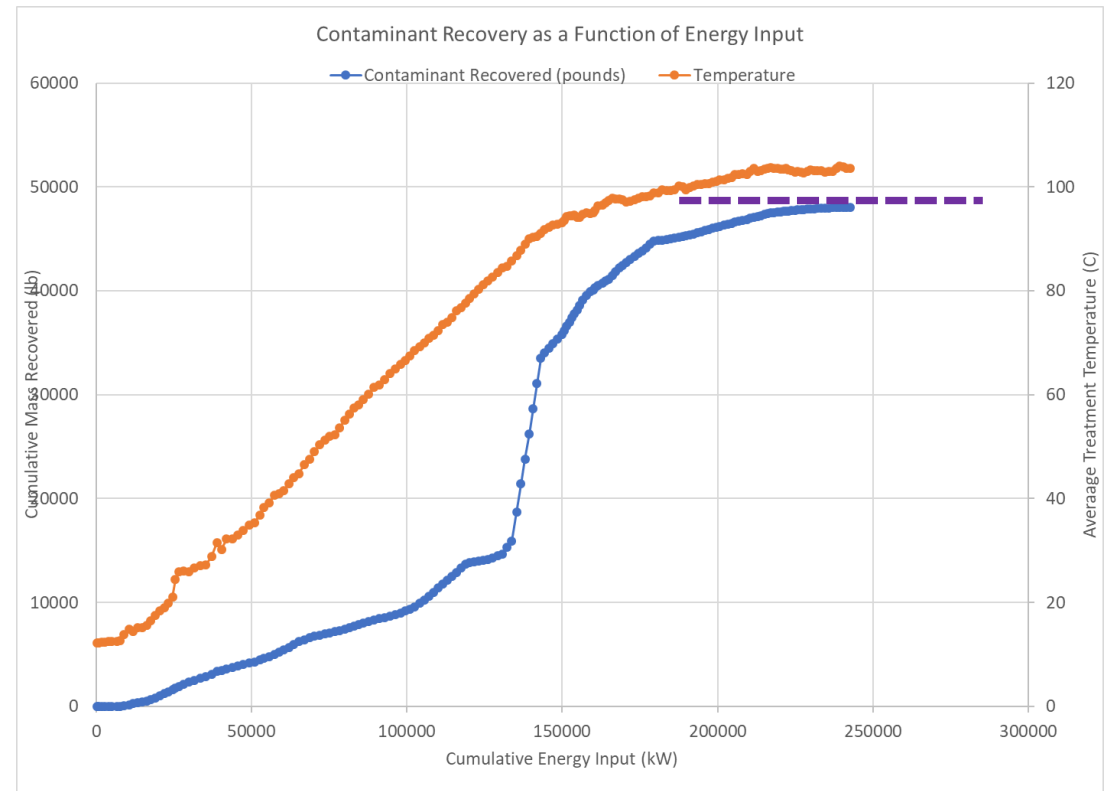
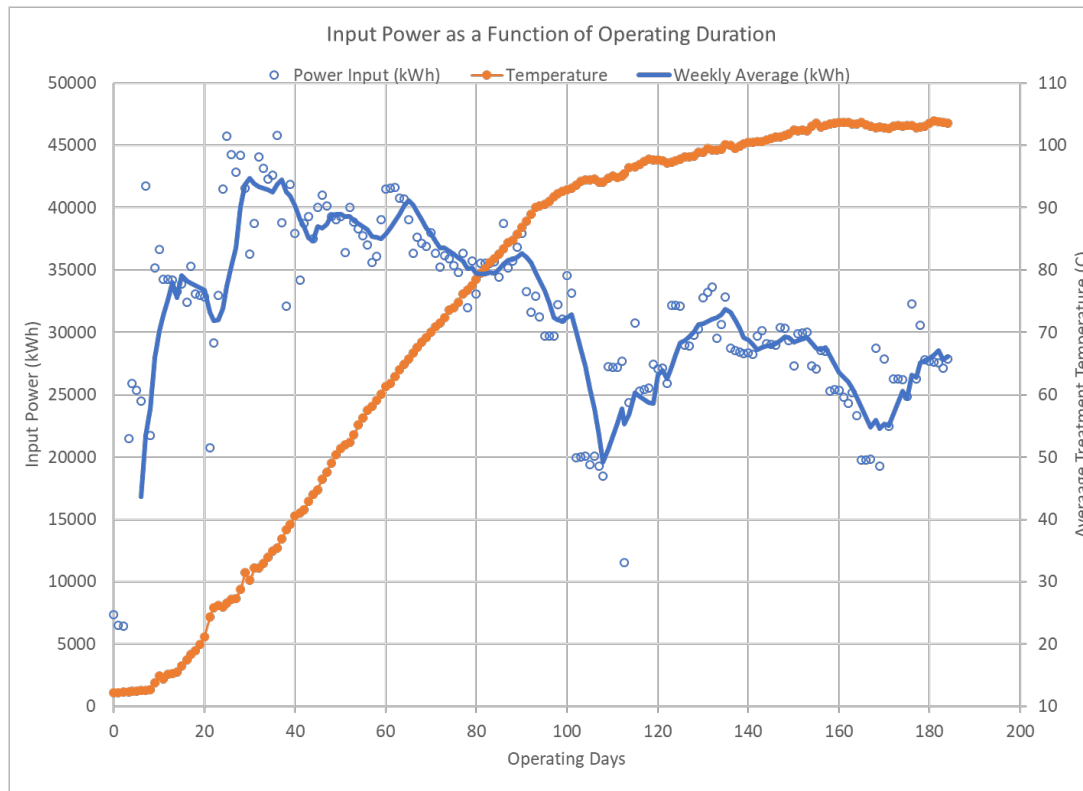
1. *Treatment of the source area using ISTT has reached an asymptotic rate of COC recovery (OU1 ROD).*



Key Point: With increasing time the total mass removed stabilizes and treatment zone temperature remains stable or increases.

Diminishing Returns – Criterion 2

2. Additional input of subsurface energy will not increase COC mass removal rate (OU1 ROD).



Key Point: With continued energy input contaminant mass removed levels off.

Diminishing Returns – Criterion 3

3. *Extended operation of the ISTT system offers no further reduction in DNAPL mobility and migration from the shallow outwash (OU1 ROD).*

